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THE WORLDWIDE DESIGN STUDIO

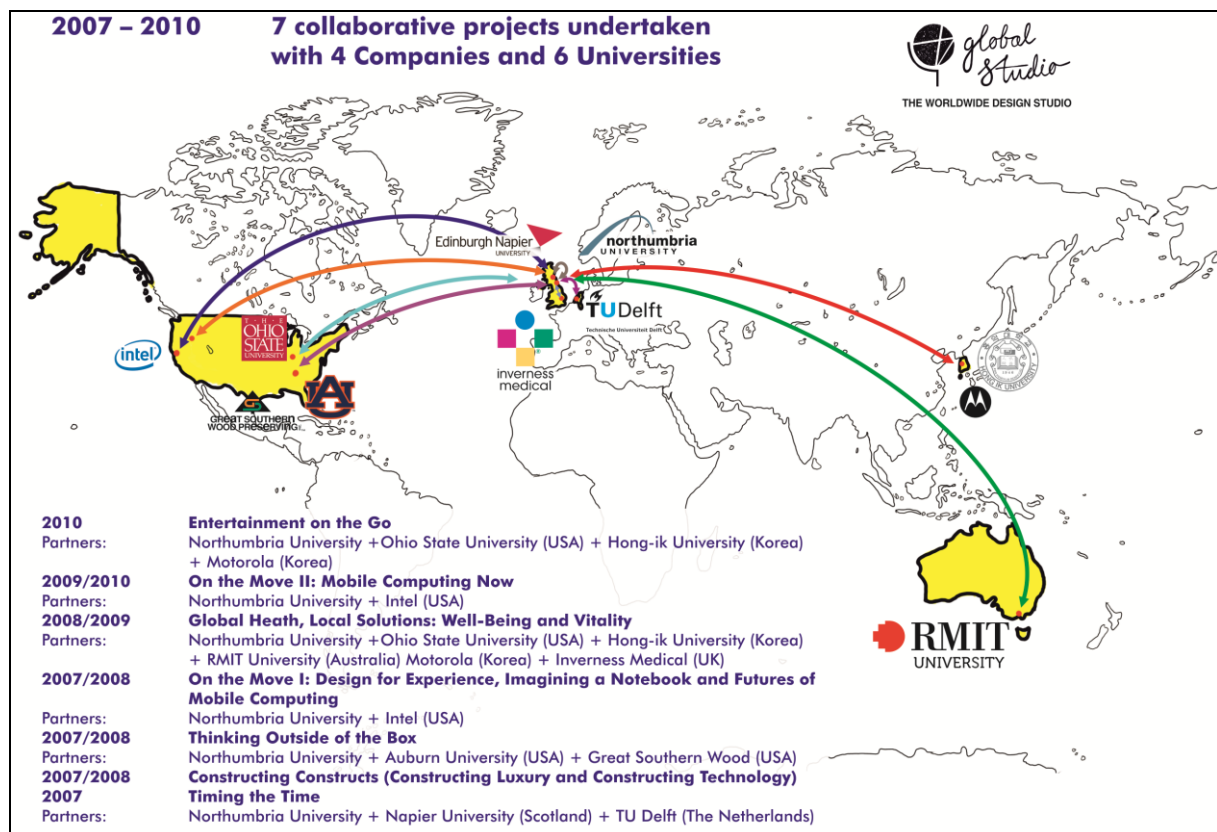
Dissemination of innovative teaching and learning practice

Global Studio

Erik Bohemia and Kerry Harman

Introduction

During the past four years, academics from the School of Design at Northumbria University have developed and implemented an innovative international collaborative teaching and research model named 'the Global Studio'. The Global Studio is a cross-institutional research informed teaching and learning collaboration conducted between Northumbria University and international universities and industry partners. Participating institutions based in the UK, USA, Netherlands, Australia and Korea included: TU Delft, Napier University, Hongik University, Ohio State University, Auburn University, RMIT University, Inverness Medical Innovation, Motorola, Great Southern Wood and Intel Corp.



The aims of the Global Studio are linked with current and future industry needs associated with contemporary changes in the development of products and services (e.g. Bohemia & Harman, 2008; Clough, 2002; Cox, 2005; Engardio & Einhorn, 2005; The Design Skills Advisory Panel, 2006) including the shift to the use of distributed teams in the product development process. These changes highlight the importance of equipping design students with skills for working in globally networked organisations particularly the development of skills in intercultural communication and collaboration (Bohemia & Harman, 2008).

A focus of the Global Studio is developing a better understanding of product development processes in globally distributed and cross-cultural design teams. The Global Studio is enabling staff and students at Northumbria University, located in the North East of England, to work in a cross-disciplinary and cross-institutional context with staff and students from the participating partners. The cross-institutional collaboration is enabling the intersection of various disciplinary approaches which are facilitating the development of innovative practices.

Following in the tradition of the design studio, with its emphasis on project-based learning and learning in and through 'doing' (Schön, 1985), students in the Global Studio design a product and/or service using a design process methodology (Cooper, 2001; Pahl & Beitz, 1996; Roozenburg & Eekels, 1995). The emphasis on project-based learning in the Global Studio is underpinned by the assumption that this pedagogical technique contributes to embedding established design practices into the student's own repertoire. However, additional layers have been woven into the course to facilitate the development of skills in cross-organisational and cross-cultural communication and collaboration. Thus, the Global Studio integrates elements from a design studio model of education with elements that equip students with specific knowledge and skills required to work in globally networked organisations and in distributed design teams.

The report addresses the following four topics:

- The design of the 'Global Studio'
- How it might be sustained
- How project-based learning is developed and sustained online
- How collaborations with other institutions have been successfully forged and sustained

The report has been compiled in order to disseminate and share this innovative approach to designing, organising and delivering the Design Studio.

The design of the 'Global Studio'

The initial Global Studio was conceived as a course conducted annually between participating universities located in different countries. There have been a number of initiatives aimed at fostering cross-institutional international collaboration by design educators (e.g. Adams, 2002; Akar, Öztürk, and, & Wiethoff, 2004; Coxon, Allen, & de Bono, 2007; Elspass & Hollinger, 2004; Grierson, Ion, & Juster, 2006; Hildre & Fyhn, 2002; Horváth, Duhovnik, & Xirouchakis, 2003; Karjalainen & Repokari, 2007; Novoa, 2007; van Boejen & Babke-Schaub, 2007). However, global projects are often very expensive. For example, a recent collaboration between a European university and an American university cost approximately US\$200,000.* Another collaboration between a group of European universities cost approximately €50,000. Most of these costs are associated with travel for the project members to meet at the start and end of the project.

Thus, one of the major aims of the Global Studio was to provide a learning environment

* From a seminar presented at the 9th International Conference on Engineering & Product Design Education, 13-14 September 2007, Northumbria University, Newcastle upon Tyne, UK

where students could develop skills in intercultural communication and collaboration but in a way that was economically sustainable and that would enable an entire cohort of students to participate.

Another aim was to develop a structure that would enable teaching and assessment to be organised independently at each of the partner universities, thereby overcoming some of the difficulties associated with cross-institutional collaborations (Bohemia, 2004). For example, agreeing on and implementing common assessment criteria across participating institutions requires significant amount of time as these need to be approved at each of the individual universities before the Global Studio could be conducted. Therefore, in order to shorten the time needed to implement the Global Studio the existing assessment outlined at each of the partner universities were used to assess student work. In addition it was thought that the independent assessment would enable each university to emphasise to their students which elements were important for them to focus on during the project. Although this strategy enabled the Global Studio to be incorporated into existing Design Studios in a relatively short timeframe its implementation resulted in other challenges resulting from having a gap between the overarching aims of the Global Studio and the existing learning and assessment objectives in courses at participating universities. In other words enhancing skills in intercultural communication may not have been a learning outcome in existing Design Studio modules.

In the initial course, student roles and associated activities were structured throughout the project to encourage students to engage in cross-institutional communication and interaction. This was predominantly achieved through having students act in the dual roles of 'client' and 'designer' (see Figure 1). A detailed description of the organisation of the client and designer roles has been reported elsewhere (Bohemia, Harman, & Lauche, 2009).

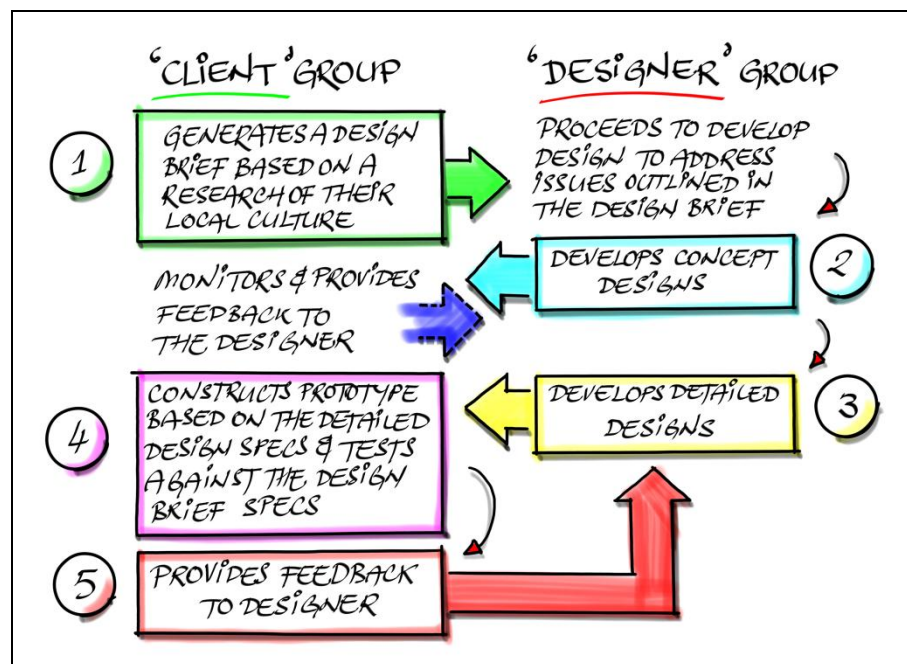


Figure 1 Key stages in the Global Studio
Note: Each group takes up both the designer and client roles

A year later the Global Studio was incorporated into a different programme in the School of Design. This resulted in changes to the design of the Global Studio as the capacity to collaborate with industry partners based in different geographic locations needed to be incorporated into the Global Studio design delivery. This provided additional challenges to those experienced in the previous Global Studio. For example, the inclusion of industry partners

increased the complexity of interaction and communication amongst the students, lecturers and industry partners, see Figure 2 and Figure 3 (Bohemia, Smith, et al., 2009).

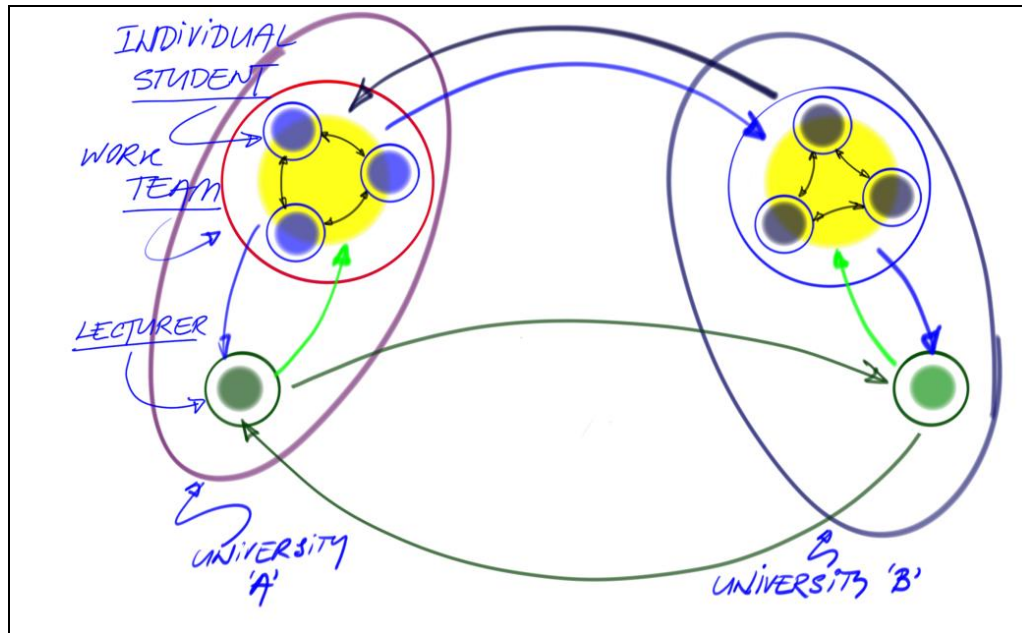


Figure 2 Interactions between student teams and lecturers in the Global Studio conducted in 2007

Note: there were multiple work teams located at each of the partner universities

The inclusion of the industry partners also impacted on how projects were structured as well as student roles and interactions. For example, since 2007/2008 it was the industry partners who took-up the role of clients within the Global Studio (see Figure 3).

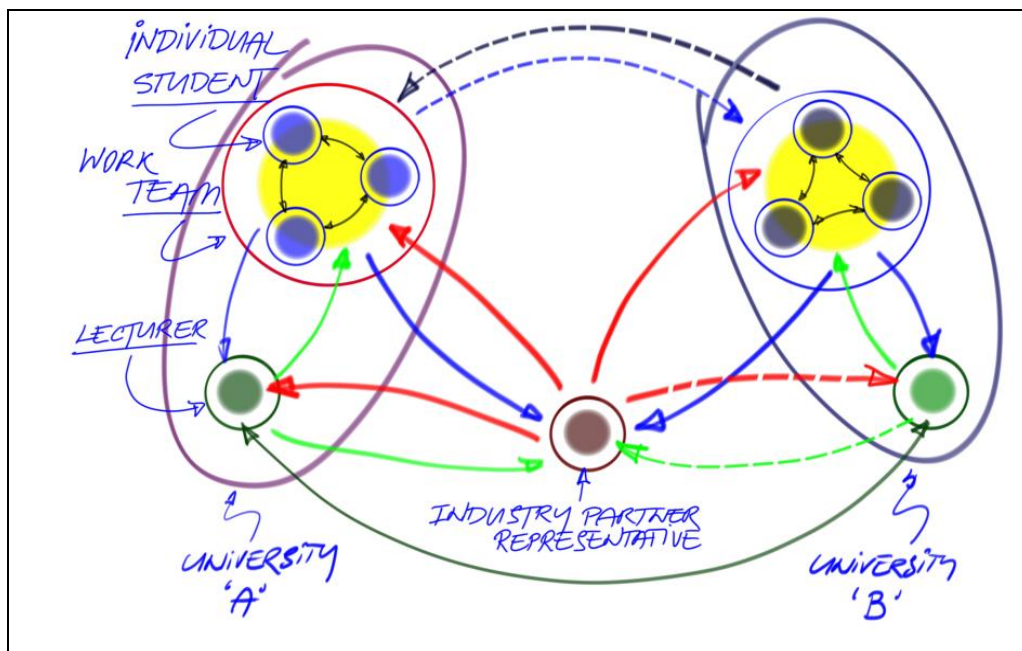


Figure 3 Increased complexity of interactions between student teams, industry partners and lecturers in the Global Studio conducted since 2008

Note: there were multiple work teams located at each of the partner universities

This meant that students from the participating universities no longer acted for each other as 'clients' and 'designers' as they had done in the initial Global Studio. This significantly changed the way students from the different participating universities interacted and communicated with each other. For example, having the industry partners acting as the clients shifted the focus of interactions between students from different universities as illustrated in Figure 1 to interaction between students and the industry partner as illustrated in Figure 4.

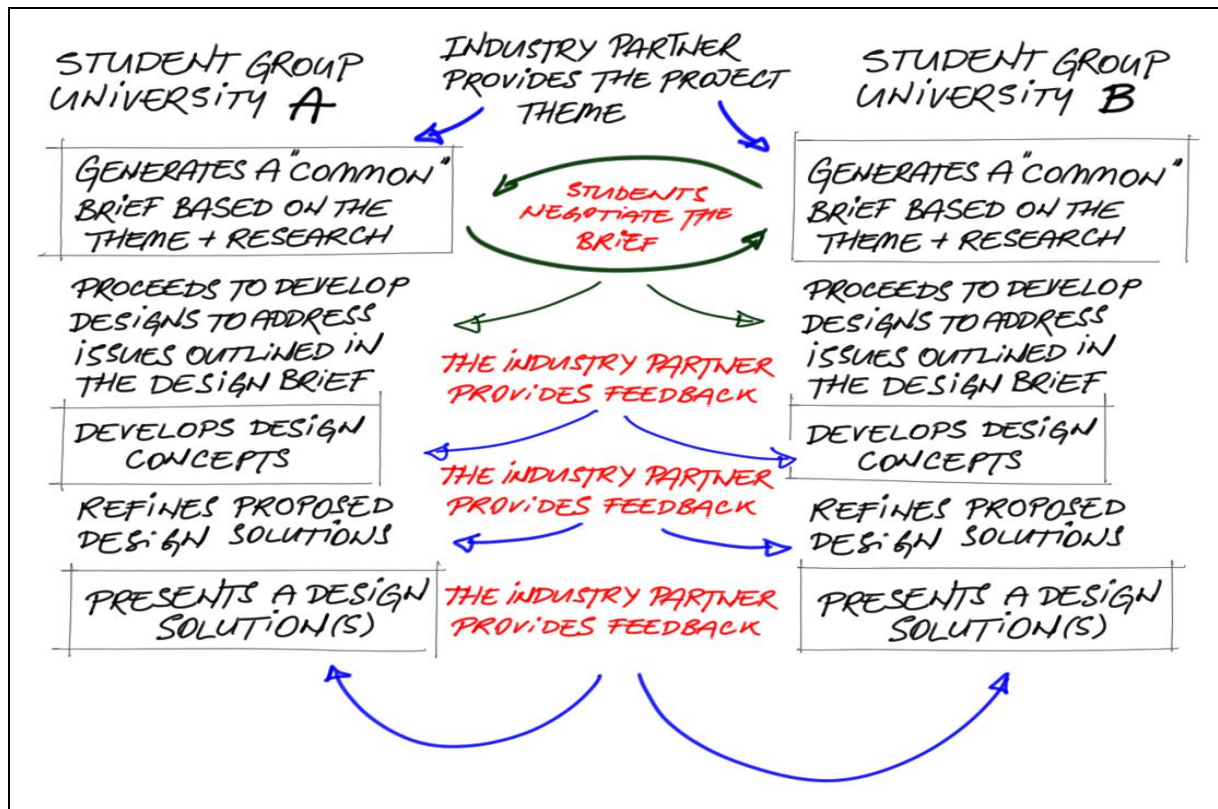


Figure 4 Key stages in the Global Studio incorporating an industry input

This has reduced the reliance of students based at one university from having input from students based at another university. A subsequent outcome was a significant reduction of interaction and need to communicate between students based at the different participating universities. For example, there was less content uploaded on each of the individual group project web pages compared to the previous Global Studio. In addition, data from the student surveys indicated that a lower percentage of students in the 2007/2008 cohort felt that the Global Studio had provided them with the opportunity to explore cultural issues and concepts (53% 2006/06, 40% 2007/08).

Over the four years nearly 450 students have participated on the Global Studio, thus demonstrating that this mode of international studio delivery is possible to be undertaken on a large scale (see Table 1).

Table 1 University and Industry partners participating within the Global Studio

Collaborative Partners	Academic Year			
	2006/2007	2007/2008	2008/2009	2009/2010
Higher Education Partners based in	<ul style="list-style-type: none"> • TU Delft (the Netherlands) • Edinburgh Napier University (Scotland) • Northumbria University (England) 	<ul style="list-style-type: none"> • Hong-ik University (Korea) • Northumbria University (England) • Auburn University (USA) 	<ul style="list-style-type: none"> • Hong-ik University (Korea) • Northumbria University (England) • RMIT (Australia) • Ohio State University (USA) 	<ul style="list-style-type: none"> • Hong-ik University (Korea) • Northumbria University (England) • Ohio State University (USA)
Number of participating individual students	63	60	147	179
Industry Partners		<ul style="list-style-type: none"> • Intel, a semiconductor chip maker (USA) • Motorola, a mmobile devices Manufacturer (Korea + UK) • Greater Southern Wood, a lumber and timber producer (USA) 	<ul style="list-style-type: none"> • Inverness Medical, a consumer and professional medical diagnostic products (UK) • Motorola, a mmobile devices Manufacturer (Korea) 	<ul style="list-style-type: none"> • Intel, a semiconductor chip maker (USA) • Motorola, a mmobile devices Manufacturer (Korea)

How might the Global Studio be sustained?

An important question that needs to be asked by prospective partners before proceeding with the design of a Global Studio is: *'Is a cross-institutional collaboration actually feasible?'* Issues that need to be considered include (Bohemia, Harman, & Lauche, 2009, p. 28):

- **Timing:** Start of academic year, semester length and public holidays differ from country to country. In addition, suitable days and times for synchronous interactions need to be established.
- **Level:** At what level should the programme be introduced? What prior skills are necessary in order for students to participate in the Global Studio? Do students at different participating institutions all need to be at the same level of study?
- **Co-ordination and project leadership:** Who is responsible for overall co-ordination of the Global Studio? Is a co-ordinator or project leader required?
- **Assessment:** What type of assessment would enhance learning in this course? For example, what proportion should be team-based? Should each project milestone be assessed? Can assessment be organised to take into account institutional differences? In addition, a question needs to be asked what should be assessed and who should be assessing?
- **Resources:** What resources would be needed to run this programme? In particular, are technological resources compatible? Would a potential difference in the level of available resources at one institution disadvantage its students?
- **Language:** What will be the lingua franca? Do staff and students have adequate skills in the lingua franca? Is this necessary?
- **Academic staff skills:** What skills should academics have to participate in and manage this type of programme? For example, academics participating in the Global Studio require skills in intercultural communication too.

In addition to the above issue the following points should be also considered:

- **Length of the project:** What should be length of the overall project? How much time should be allocated to each of project stages? How might students be provided with low stakes confidence building opportunities to practice various stages of the design process and embed these practices into their repertoire?

- Level of the industry partner support: What level of involvement should the industry partner provide? How do you ensure that students from each participating universities have appropriate access to the industry partner?
- Level of interaction between students: What level of interaction is expected to take between the students from different universities? How should this interaction be encouraged?
- Supporting students: What support should academics provide to students? Should they provide any support/feedback to students based at other universities?
- Research issues: What data should be collected? How should this data be collected? Who has access to the data? University specific ethical procedures/policy.

The above issues and associated questions foreground the complex negotiations required with internal and external stakeholders in order to establish successful cross-institutional teaching and learning collaborations (see Figure 5).

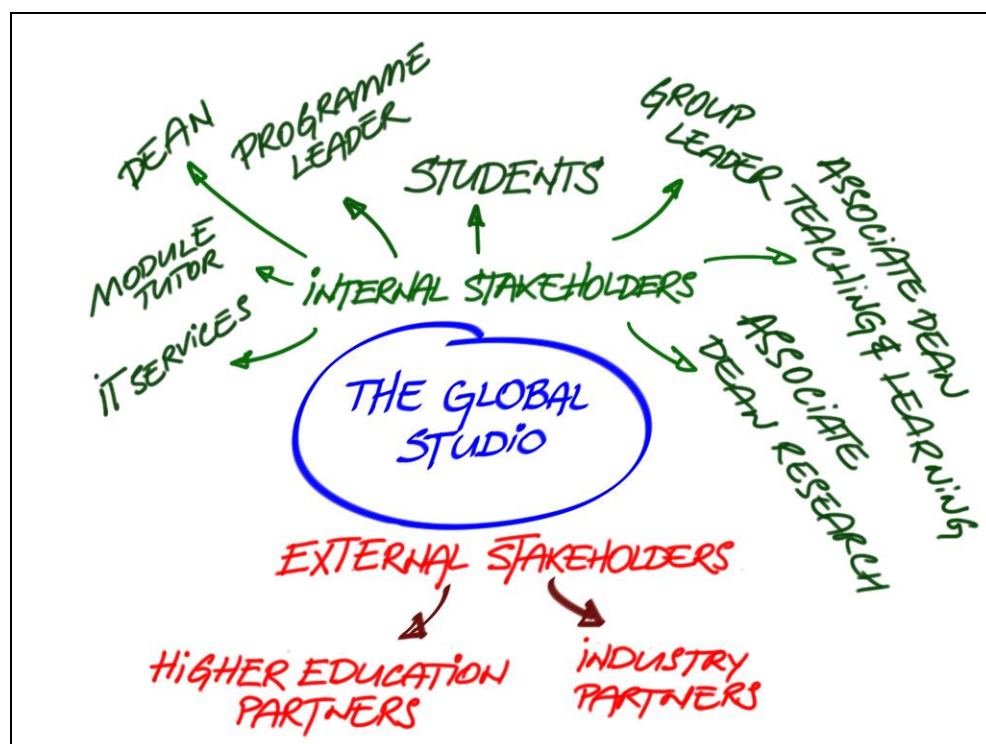


Figure 5 Internal and external stakeholders

Furthermore, project-based learning undertaken in collaboration with industry partners generally require specific disciplinary skills in order to tackle given project themes. Therefore, these industry based design projects are 'tied' to specific disciplinary programmes such as industrial design or fashion design.

How is project-based learning developed and sustained online?

The Global Studio is delivered using a blended learning approach with a combination of online learning and face-to-face teaching. An important aspect of the Global Studio is the incorporation of Web 2.0 technologies. The focus is on developing skills in distance communication and collaboration by means of these technologies.

There are various models for delivering the Global Studio. For example, the Global Studio can be conducted with other universities, as was the Global Studio in 2006/2007 or with industry partners, as is in the current Global Studio (see Table 2), or with both.

Table 2 Possible collaborative intersections for delivering the Global Studio

	University	University
University	University + University	University + Industry Partner + University
Industry Partner	Industry Partner + University	

A case study

The 2007/2008 project titled *Constructing Constructs* was conducted between Northumbria University and Korean university in collaboration with Motorola (UK and Korean design studios). This project explored themes of *Constructing Luxury* and *Constructing Technology*. The contact between the Northumbria University and design studio manager was established at an international conference. This was then followed up by further discussions to establish the project scope, timing and how the project teams were organised.

At the commencement of the *Constructing Constructs* project, students were organised into 3 work teams at each of the universities. Then, the project teams were asked to complete a short design task with the aim of creating a team 'identity'. At the end of this team building exercise each group had agreed on their team name and produced their team logo. The following project teams were briefed by the industry partner via teleconference on the two broad project themes which were New Luxury: *Constructing Luxury* and New Digital Lifestyle: *Constructing Technology*. The next task was for the work teams to develop a design brief addressing one of the two themes. These design briefs were then discussed and fine-tuned with the industry partner. After the design briefs were agreed on the work teams undertook tasks such as brainstorming, mind mapping, market research and user research. At each of the key stages of the project students uploaded their work onto a shared secured space for review by their industry partners. All students, industry partners and academic staff had access to this space. Based on these exercises they then started to develop initial concepts which were presented to the industry partner for evaluation. Based on this feedback they further developed a specific concepts to illustrate their design solutions. Again these were reviewed by the industry partner. Final presentations of design proposals were communicated to the industry partner via posters, a movie and design process diaries (see Figure 6).

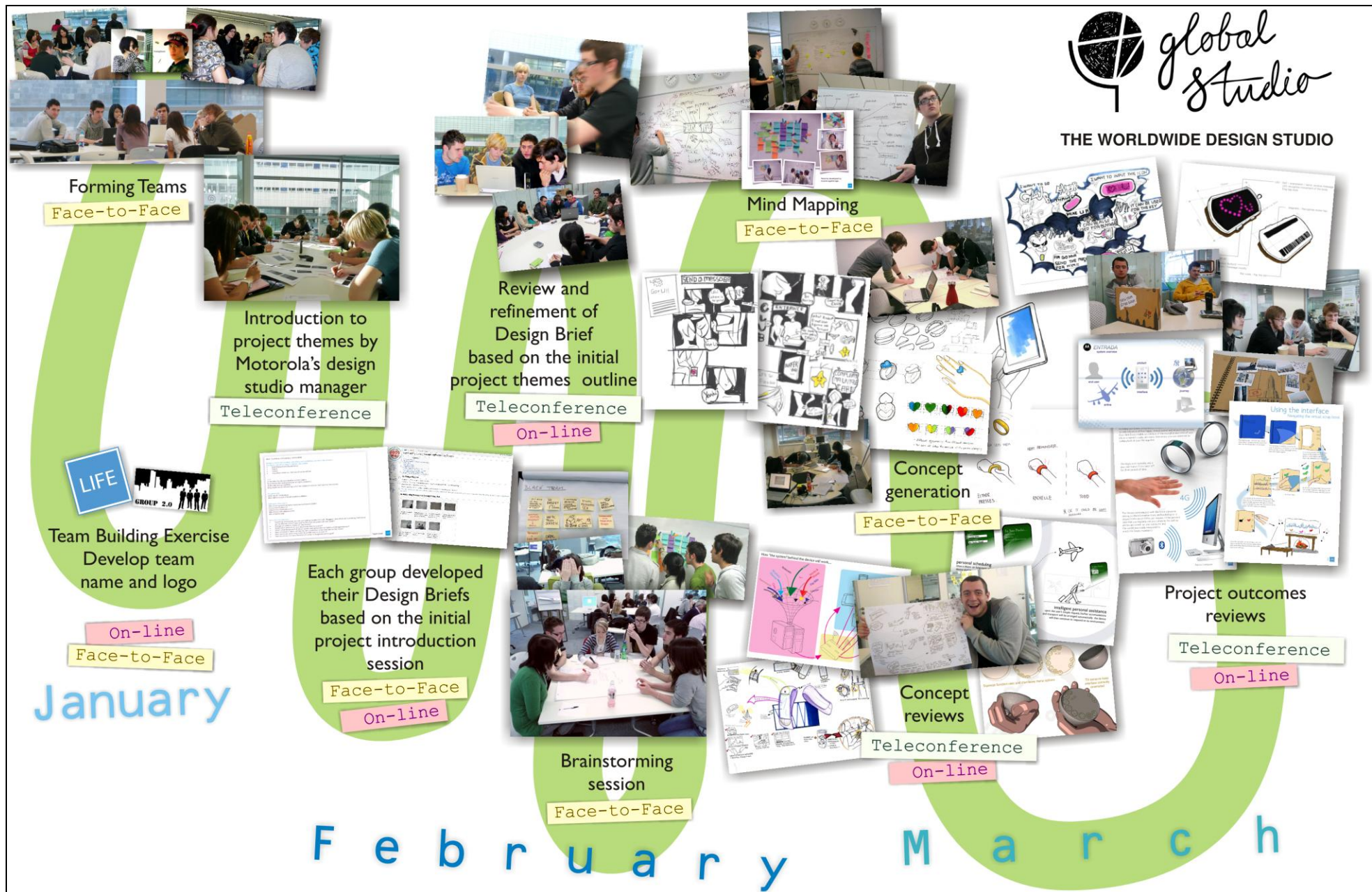


Figure 6 Constructing Constructs project design process (2008)

Strategies for encouraging online collaboration

One of the strategies used in the Global Studio to encourage online collaboration is to schedule regular project progress reviews with the industry partners. As industry partners are physically located at another city/country these reviews needed to be conducted at a distance. Therefore, online technologies such as Wiki pages and tele/videoconferencing were used to facilitate distributed communication between the university and industry partners. For example, the *Constructing the Construct* work teams from the Korean and Northumbria universities conducted seven virtual meetings with the industry partner during 10 weeks while the project was running using both Wiki pages and teleconferences (Bohemia, Smith, et al., 2009).

How are collaborations with other institutions successfully forged and sustained?

Regular contacts with representatives from the other universities and industry partners help to sustain these relationships. These contacts can be used to evaluate projects, writing collaborative papers and funding applications and planning for future collaborative projects. In addition, industry partners' ongoing feedback provided to students also facilitates regular contacts.

Attracting funding also helps with sustaining these relationships. For example, funding enables academics to visit their industry and/or university partners as well as disseminating research outcomes at international conferences. It also provides resources to facilitate the development of research networks, support staff sabbatical exchange visits and provide the means for student exchanges.

Managing multiple relationships

There are at least four types of collaborative partnerships that need to be developed. The first is the development of partnerships with other universities. The second are partnerships with external industry partners. The third partnership is with university service support sections such as IT and eLearning and the fourth is with internal and external funding bodies.

Managing and sustaining the above relationships requires the allocation of resources such as time. Therefore, those involved in conducting programmes such as Global Studio need to be supported by their institutions to allow them to engage in cross-institutional collaboration activities.

A model for forging and sustaining successful cross-institutional collaborations

An initial conceptualisation of the Global Studio was that it would enable a research network to be established among the participating institutions in order to gain a better understanding of the ways cross-disciplinary, cross-institutional and cross-cultural design projects are undertaken. This links with an ongoing aim of the Global Studio for the development of collaborative partnerships with industry and the exploration of practice led research on distributed design, see Figure 7. In better understanding how design work is undertaken in distributed work settings, for example the ways particular technologies enable and constrain the design process, innovative solutions might be developed for organising distributed design teams and collaboration across distance. In addition to providing a site for examining product development in geographically distributed work groups, the Global Studio also provides a site for undertaking research with a focus on teaching and learning.



Figure 7 Linking Research, Education and Practice

A summary of the impact of the Global Studio at Northumbria University

The Global Studio has contributed to a number of key strategic university goals at Northumbria University such as delivering an outstanding student experience; developing excellence in research informed teaching; generating high quality research outputs; increasing research income by engaging with business and funding bodies; and creating a collaborative culture (internally and externally) which actively encourages teamwork, development of staff expertise, and interaction with strategic partners regionally, nationally and internationally. In addition, the Global Studio has enabled participating academic staff to develop research and scholarly activities and it facilitated the development and implementation of research informed curriculum and innovative pedagogic practices. For example, the Global Studio generated close to £100,000 of research income, it enabled the production of more than 20 research outputs including a book (Bohemia, Harman, & Lauche, 2009), journal articles (Bohemia & Harman, 2008; Bohemia, Harman, & McDowell, 2009; Lauche, Bohemia, Connor, & Badke-Schaub, 2008), international conference papers (e.g. Bohemia & Harman, 2009; Bohemia et al., 2007; Bohemia, Lauche, & Harman, 2008; Bohemia, Lauche, Langeveld, & Badke-Schaub, 2006; Bohemia, Smith, & Harman, 2008; Lauche et al., 2007) and it led to numerous invited workshops and guest lectures at leading international universities. During the past four years, seven international collaborative research projects involving high profile overseas universities and multinational industry partners in collaborative research activities have been undertaken within the Global Studio.

Evaluation results from the Global Studio conducted in 2007, 2008, 2009 suggest that the majority of students from participating universities perceived this innovative initiative facilitates their learning, especially in the intended areas of development of virtual teamwork and communication skills. The vast majority of students also felt that the Global Studio provided them with a positive learning experience in comparison to other modules:

- *Just took part in the global studio project and it was amazing! thanks for making everything possible.*
- *This was my favourite class-ever. I enjoyed the experience of working with many international groups.*

- *It was first time to working with foreign students. So, only that reason. It was be Great experience.*
- *The best thing about the global studio was the chance to work with students across the globe. It was different to have students from across the globe giving use feedback on the work that we had done.*
- *The best thing about the Global Design is experience to do with another country's student. It is not normal chance. This project make me have more confidence and give me a interest about design. It is most important and best thing to me in this project.*

Students enjoyed creating their own group project pages. They also commented that this provided them with an opportunity to creatively share their work and project progress amongst the distributed and collocated group members. They appreciated flexible access to information facilitated by the project websites. Many students commented on the usefulness of observing other students' progress and work on online project pages. They have indicated that this has allowed them to compare their own work with the work of the other students, which has facilitated their reflective practice:

- *You can look at other peoples work and see what they are doing in comparison to yours and it helps improve your skills*
- *Seeing the range of work by other students was rewarding*
- *It was my first time to work with student across the country so it was great chance to watch how other countries students approach to issues, develop concepts and other processes.*

Further, the project stages have been scheduled so that they provide students with low stakes confidence building opportunities to practice various stages of the design process and embed these practices into their repertoire.

Conclusion

Issues associated with initiating and running the Global Studio in some respects are similar to those associated with initiating and running other project-based courses. However, within the Global Studio these issues are amplified as additional factors, such as external stake holders' needs and wishes, need to be taken into consideration. This means that setting-up and conducting the Global Studio is beyond just one person. The complex negotiations required to organise the Global Studio, both internally and externally lead us to recommend that the Global Studio be embedded in a core Design Studio module in the programme. This would contribute to making this innovative model of curriculum delivery more sustainable as once the critical negotiations have been worked through they are in place for ongoing delivery. Furthermore, the overarching aims of the Global Studio in terms of enhancing skills in intercultural and distance communication need to be foregrounded. At present, this is often neglected in both the delivery and assessment of the module.

From our experience, we propose that setting-up and conducting the Global Studio requires substantial backing and support from senior managers within the Schools/Faculties as well as institutional IT support. This is in addition to the commitment that is needed from those who are and/or will be directly involved in conducting it.

However, as outlined above, the Global Studio could provide benefits which potentially address a number issues Higher Education is currently facing. For example, the Global Studio provides an opportunity for internationalising the design curriculum where students are able to practice intercultural communication in collaboration with their international peers. It could also provide students with a novel way to engage with international industry mentors. In addition it has the potential for academics to forge strong international relationships with their

academic peers and industry partners thus potentially providing a fruitful ground for developing research projects involving industry and universities.

In addition, the Global Studio provides a platform for teaching staff to continue their professional development in areas such as e-Learning and practice-based Teaching and Learning. The Global Studio could also be used to promote the sharing of resources such as teaching strategies and techniques and collaboration in relation to curriculum development across participating Higher Education institutions.

Acknowledgement

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Further information on the Global Studio is available at www.theglobalstudio.eu

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